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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,526	02/24/2005	Ryo Motohashi	P26642	7035

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EXAMINER	
GUIDOTTI, LAURA COLE	
ART UNIT	**PAPER NUMBER**
3723	

NOTIFICATION DATE	DELIVERY MODE
10/11/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/525,526	MOTOHASHI ET AL.	
	Examiner	Art Unit	
	Laura C. Guidotti	1744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 14-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 14-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1-3 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiedemann et al., US 5,448,792 in view of Kofink, DE 29 06 404 (see English translation) and in further view of Martin et al., US 4,787,847.

Wiedemann et al. disclose a power toothbrush comprising a brush head (5) and an actuator for moving the brush head (entirety shown in Figure 3) for reciprocally moving a brush head in a linear direction of a longitudinal axis (8; Figures 1-2) and in a rotary direction about a longitudinal axis (9; Figures 1-2) in order to thoroughly loosen and wipe tooth surfaces (Column 2 Lines 5-17, 42-50), the amplitude of a reciprocal movement of the brush in an axial direction of the drive shaft is 2mm (Column 2 Lines 42-46), a frequency of the reciprocal movement of the brush head in an axial direction of the drive shaft is between 60 Hz and 70 Hz (Column 2 Lines 42-46), and an angle of a reciprocal swing motion of the brush around a center axis of the drive shaft can be as small as ten degrees (or 10-30 degrees, Column 2 Lines 46-50). The brush head (5) is fitted to a drive shaft (3). Wiedemann et al. does not disclose that the frequency of reciprocal movement of the brush head in an axial direction of the drive shaft is in a range of 100Hz to 350Hz or that the actuator includes a first or second magnetic circuit. It is noted however, that the frequency of the reciprocal movement of the brush head in

an axial direction of the drive shaft is only 30 Hz outside the range of the claimed range of 100 Hz to 350 Hz.

Kofink teaches an actuator that has a drive shaft (4), a first magnetic circuit for reciprocally moving the drive shaft in an axial direction thereof (at 11, formed by stators 8, coils 13, grooves 14), and a second magnetic circuit for reciprocally rotating the drive shaft around the center thereof (at 9, formed by stators 7 and unlabeled coils), the first magnetic circuit and the second magnetic circuit directly move the drive shaft (see directional arrows in the Figure and Abstract), the first magnetic circuit (at 11) further comprises a first permanent magnet unit fixed to the drive shaft (12; Abstract), a pair of first stators (8) and a pair of first windings respectively wound around the first stators (13), the second magnetic circuit further comprises a second permanent magnet unit fixed on the drive shaft (10), a pair of second stators (7) and two pairs of second windings wound around poles of the second stator (as it appears in the Figure that each stator has a winding wound twice, or a pair of windings on each stator), the first permanent magnet unit is linearly moved in the axial direction of the drive shaft while a driving current is supplied to the first windings (Figure, directional arrow, Abstract) and the second permanent magnet unit is rotated around the center axis of the drive shaft while a driving current is supplied to the second windings (Figure, directional arrow, Abstract), and a pair of coil springs which are capable of applying pressing forces to position the first permanent magnet unit and the second permanent magnet unit at initial positions while the actuator is not activated (see English translation, Page 4 Lines 22-24 describes "springs that are supported on mounting points...", Page 6 Lines 16-18

describes one spring 17 that is shown in the Figure). Regarding claim 2, the first magnetic circuit and the second magnetic circuit are capable of being activated simultaneously (see English translation, Page 6 Lines 8-15). Regarding claim 3, the first magnetic circuit and the second magnetic circuit can be activated (activated via circuitry, see Figure). Regarding claims 14-15, the first and second magnetic circuits (at 9 and at 11) is periodically driven by switching on an off of supplying driving current (as the current is alternating current, see English translation Page 4 Lines 10-18, Page 6 Lines 21-26), and the reciprocal movement of the drive shaft is sustained owing to sympathetic vibrations of the coil springs while the driving current is not supplied to the circuit (paragraphs 35-36, 38). It is particularly noted that the actuator of Kofink is for toothbrushes (see English translation, Page 5 Line 8).

Martin et al. teach a dental hygiene device that teaches a desired frequency of 200-500 Hertz, and specifically about 350 Hz so that "mild cavitation occurs within the subgingival fluid sufficient to disrupt and remove plaque and to demobilize motile rods and spirochetes without damaging the surrounding soft tissues" (Column 4 Line 61 to Column 5 Line 13).

It would have been obvious for one of ordinary skill in the art at the time of the invention to substitute the entire actuator system of Wiedemann et al. for one that has an actuator system that has first and second magnetic circuits, as Kofink teaches, in order to provide reciprocal motion in both a linear and rotary direction with one singular actuator element and further it would have been obvious for one of ordinary skill in the art at the time of the invention to modify the frequency of reciprocal movement of the

brush of Wiedemann et al. and Kofink in an axial direction of the drive shaft to a range of 100 Hz to 350 Hz, as Martin et al. teach, in order to disrupt and remove plaque without damaging surrounding soft tissues and also it would have been obvious to optimize the frequency to the range of 100 Hz to 350 Hz in order to optimize the toothbrush to produce an optimal working condition for a user.

2. Claims 4-11 and 14-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiedemann et al., US 5,448,792, Kofink, DE 29 06 404 (see English translation), and Martin et al., US 4,787,847 as applied to claim 1, in view of Li, US 6,429,611.

Wiedemann et al., Kofink, and Martin et al. disclose all elements mentioned above. The actuator of Kofink further includes sensors (14, 15, 16) and that the electric current is supply is programmable to that the speed and stroke can be regulated via electronic controls or control system (see English translation Page 6 Lines 1-15, Page 4 Line 10 to Page 5 Line 8). Wiedemann et al. and Kofink do not include an inverter.

Li teaches a rotary and linear motor that also uses sensors (32) and (34) to indicate a linear displacement or a rotary angle of a rotor (12) and feeds this data back to motor control algorithms (Column 4 Lines 3-6). Li further teaches the use of an inverter (26) capable of generating currents having predetermined frequencies and a phase difference therebetween wherein the phase difference is capable of being zero (or "in phase"), and supplied to the first magnetic circuit and a second magnetic circuit (there are three magnetic circuits 18a-18c; Column 3 Lines 58 to Column 4 Line 3, Column 4 Lines 7-58). Regarding claim 5, the driving currents are inherently alternating

currents (AC) as "an inverter" by definition is "a device used to convert direct current into alternating current" (*The American Heritage® Dictionary of the English Language, Fourth Edition Copyright © 2000 by Houghton Mifflin Company.)* Regarding claims 6-11, the frequencies and/or phase difference between the currents are capable of being adjustable (via altering a software program, Column 4 Line 59 to Column 5 Line 15), and by being adjustable are capable of having specific phase differences or frequencies that are integral multiples thereof or the ratio of frequencies not being an integer.

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify the control system of the actuator of Wiedemann et al. Kofink, and Martin et al., to include an inverter, as Li teaches, in order to responsively control the driving currents supplied to the circuits.

Response to Arguments

3. Applicant's arguments filed 19 July 2007 have been fully considered but they are not persuasive.

The Applicant argues that Wiedemann does not disclose the presently claimed ranges now found in independent claims 1, 16, and 20. The Examiner respectfully disagrees. As stated above, the amplitude of a reciprocal movement of the brush in an axial direction of the drive shaft is 2mm (Column 2 Lines 42-46) and an angle of a reciprocal swing motion of the brush around a center axis of the drive shaft can be as small as ten degrees (or 10-30 degrees, Column 2 Lines 46-50). Regarding the range of a frequency, Wiedemann does disclose a range between 60 and 70 Hz, but not between 100 and 350 Hz as claimed. At this time, Martin et al. has been presented as

teaching a frequency of 350 Hz in a reciprocal toothbrush in order to remove plaque without damaging nearby soft tissue.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura C. Guidotti whose telephone number is (571) 272-1272. The examiner can normally be reached on Monday-Thursday, 7:30am - 5pm, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gladys Corcoran can be reached on (571) 272-1214. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Laura C Guidotti
Patent Examiner
Art Unit 1744

lcg